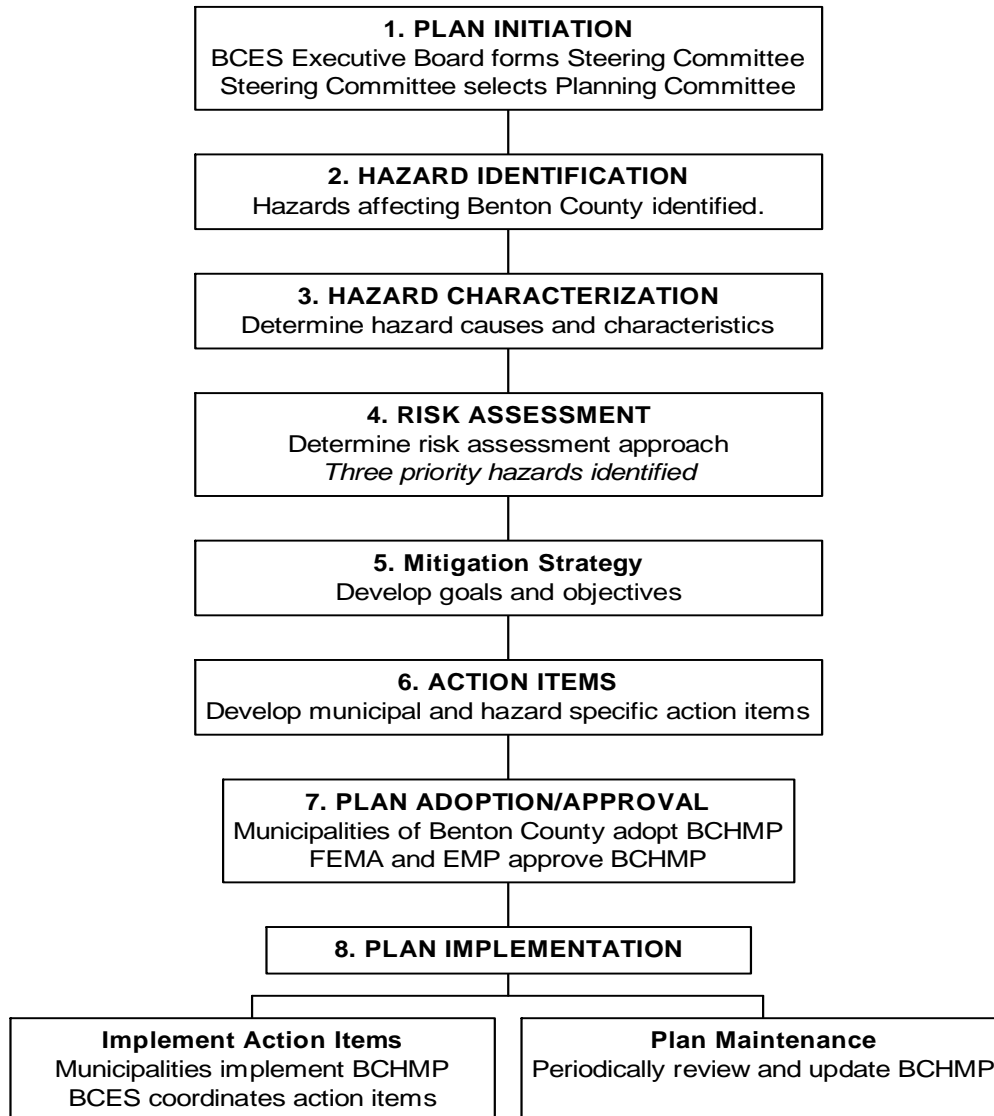


### 3. HAZARD MITIGATION PLANNING PROCESS


The planning process used to develop the BCHMP is shown in Figure 3-1. This BCHMP includes steps 1 – 7 (e.g., through plan adoption and approval). How these steps were accomplished is described in the following sections. Plan implementation and maintenance (step 8) represent the future, and are outlined in Section 6.

**Figure 3-1. BCHMP Planning Process**



#### 3.1 Plan Initiation

The municipalities of Benton County, including the cities of Benton City, Kennewick, Prosser, Richland, and West Richland, and Benton County, determined to join together and prepare a multi-jurisdictional Benton County Hazard Mitigation Plan (BCHMP). The Executive Board of

the Benton County Emergency Services (BCES) was selected to be the BCHMP Steering Committee, and assigned the task of directing the development and implementation of the overall Plan on behalf of the municipalities. The Executive Board (Steering Committee) mposed of a representative from each of the municipalities of Benton County. At the initiation of this BCHMP, the Steering Committee consisted of:

- Kim Baldwin, Benton City Councilmember
- Max Benitz, Jr., Benton County Commissioner
- Ken Carter, Manager, City of Prosser
- John Darrington, Manager, City of Richland
- Bob Hammond, Manager, City of Kennewick
- Donna Noski, City of West Richland Councilmember

The Steering Committee appointed an initial Planning Committee to initiate and oversee formulation and maintenance of the BCHMP, and to coordinate hazard mitigation action items between the involved municipalities. The initial BCHMP Planning Committee consists of:

- Russ Amato, Williams Pipeline Company
- Linda Boomer, Port of Kennewick
- Jack Clark, Kennewick Public Works
- Teresa Esparza, Cascade Natural Gas Company
- Bob Gear, Chief, Benton County Fire District No. 1
- Colin Hastings, Tri-Cities Home Builders Association
- Stephen Lockhaven, Framatome ANP
- Terry Marden, Benton County Planning Director
- Tom Probasco, Framatome ANP
- Tony Schouviller, Benton County Public Works
- Mike Smith, Kennewick Administrative Service
- Ken Taylor, Kennewick Police Department
- Mark Yaden, Kennewick Fire Department

The Planning Committee identified hazards to be addressed within the BCHMP, including the identification of three priority hazards: floods, wildfires, and windstorms. The Planning Committee was supported in their hazard mitigation planning efforts by the municipalities, BCES staff and their contractor, and members of the public and other stakeholders.

### **3.1.1 Municipal Support**

All of the municipalities of Benton County supported the initiation, development and implementation of the BCHMP by:

- Writing letters in support of obtaining a hazard mitigation planning grant for Benton County and committing matching funds.
- Providing representation on the Steering Committee
- Providing representation and/or assistance to the Planning Committee
- Making staff and resources available for hazard characterization.
- Providing technical assistance throughout the planning process.
- Developing mitigation action items to address priority hazards.
- Assigning priorities to their mitigation action items.

- Assisting in the public involvement process including participating in interviews and providing staff support for public meetings.
- Reviewing the draft BCHMP and providing suggested revisions.
- Adopting the BCHMP and recommending it be forwarded to the Washington Military Department, Emergency Management Division and Federal Emergency Management Agency for approval.

### **3.1.2 BCES Support**

Benton County Emergency Services (BCES) is the agency tasked with supporting the Planning Committee in developing and maintaining the BCHMP. BCES staff assisted the Steering Committee and Planning Committee in the Plan scoping, development, preparation, and distribution. BCES managed the grant from the Washington State Emergency Management Division that supported the development of the Plan. In addition, BCES procured and directed the services of a contractor team to provide planning, engineering, and public involvement assistance in preparing the Plan.

### **3.1.3 Contractor Support**

BCES directed the efforts of a team led by HDR Engineering, Inc. in providing planning, engineering and public relations services for the development of the BCHMP. The HDR Engineering team included Vista Engineering Technologies, L.L.C. and ECO Resource Group. HDR Engineering provided overall team/project management, hazard analysis, risk assessment, and process development support. Vista Engineering provided geotechnical support (e.g. hazard characterization of earthquakes, landslides, and volcanos) and general process support. ECO Resource Group focused on public involvement and communication efforts.

Overall, the HDR team provided BCES with technical support in the following areas of work:

- The planning process
- Hazard characterization
- Risk assessment
- Development of a mitigation strategy
- Creation of a process for plan maintenance
- Facilitation of plan adoption by the municipalities
- Plan documentation

### **3.1.4 Stakeholder Support**

Additional assistance, information, and support for this BCHMP was provided by various agencies and other departments of Benton County and the cities of Benton City, Kennewick, Prosser, Richland, and West Richland, as well as members of the public and other stakeholders. These stakeholders are identified in Appendix B. Public Involvement.

## ***3.2 Hazard Identification***

The Planning Committee identified natural and technological hazards that have or can affect the municipalities of Benton County. The hazards were identified through input from the Benton County HMP Steering Committee, County and City agencies, community groups, the

Washington Division of Emergency Management, the Washington Natural Hazard Workgroup, and other stakeholders. The Planning Committee's hazard identification process was supported by a review of potential hazards and known prior hazard events conducted by the HDR team.

Hazards identified for Benton County are:

Natural Hazards

- Flood
- Landslide (e.g., slope stability)
- Wildfire
- Severe Winter Storm
- Windstorm
- Earthquake
- Volcanic Eruption (e.g., ashfall)
- Drought

Technological (Man-made) Hazards

- Civil Disturbance
- Hazardous Materials & Chemicals
- Pipeline
- Radiological
- Terrorism
- Transportation
- Urban Fire
- Other Local Hazard – Hanford Site
- Other Local Hazard – Umatilla Chemical Depot
- Other Local Hazard – Columbia Generating Station

### ***3.3 Hazard Characterization***

Hazard characterization describes the causes and characteristics of each hazard, how it has affected the County in the past, and what part of Benton County's population, infrastructure, and environment has historically been vulnerable to each specific hazard. The hazard characterization is based on geographic extent of the hazard, the severity of the hazard, and the probability of its occurrence. Preliminary hazard characterizations were conducted for each of the hazards identified above, and are presented in Chapters 4 and 5 of this Section.

Benton County has identified three hazards as priorities for further characterization and mitigation: flood, wildfire, and windstorm. The characterization of these three hazards is presented in greater detail than the other hazards considered to pose a lower potential risk. These hazards are described in Section 4. Priority Hazards, including information on past occurrences, hazard characteristics, risk assessment approaches, community concerns, ongoing mitigation efforts, potential approaches to mitigation, and a listing of other available resources.

The other hazards were not subject to detailed analyses. Additional analyses to characterize these hazards will be conducted in the future based on periodic reviews of this hazard mitigation plan and available resources. Preliminary information on the other hazards is presented in Section 5.

### 3.4 Risk Assessment

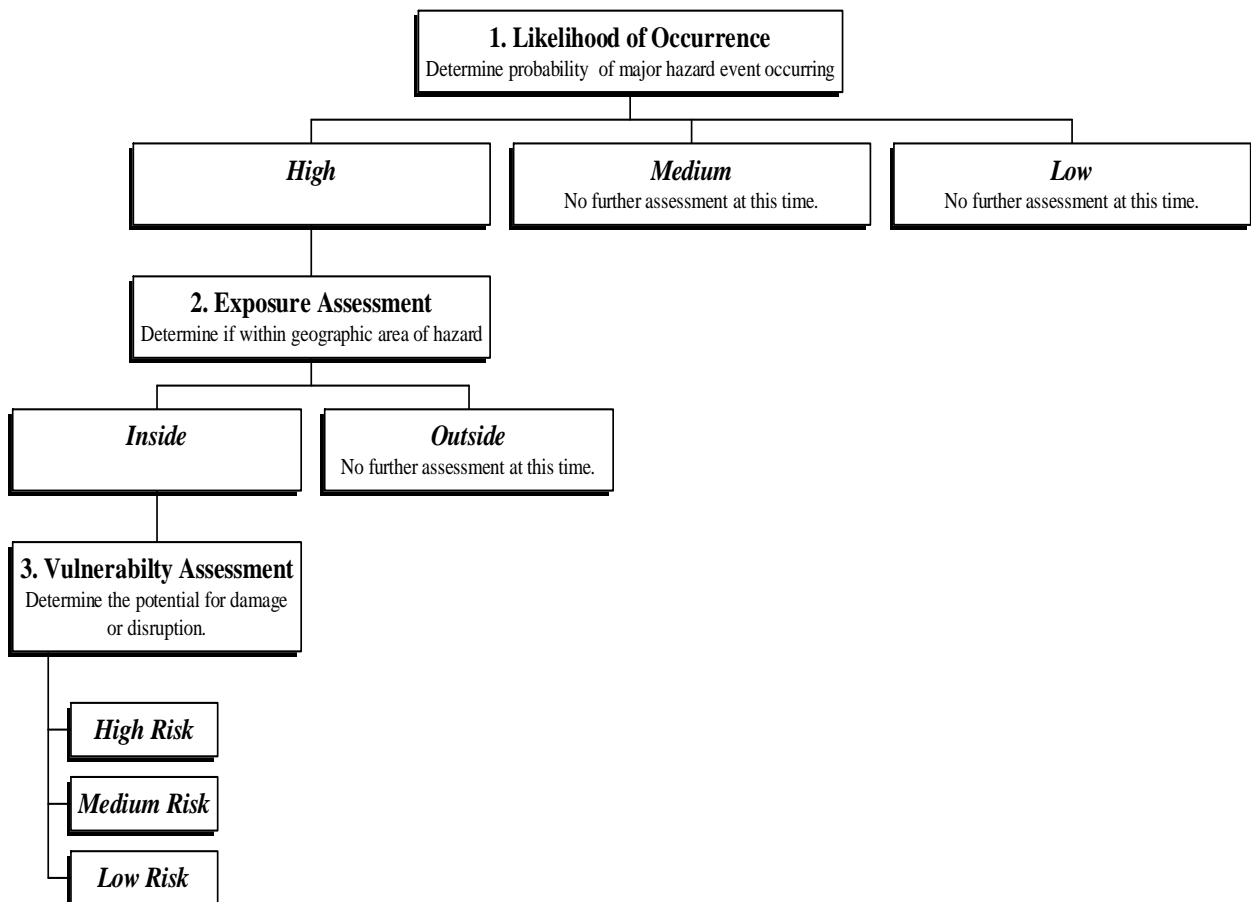
#### 3.4.1 Risk Assessment Process

Risk assessment evaluates the level of risk that Benton County has relative to the identified hazards. Risk assessment for this plan is based on addressing three questions and merging the results:

1. What is the **likelihood** of the hazard occurring in Benton County?
2. What elements (e.g. population, property, infrastructure and environment) of Benton County are directly **exposed**?
3. How **vulnerable** is the exposed population, property, infrastructure, and environment to damage, injuries, or other losses resulting from the specific hazard occurrence?

This Plan uses the results of the risk assessment process to screen the hazards; e.g., identifying those hazards considered a priority for mitigation based on the associated risks. The risk assessment process is shown in Figure 3.4-1 and explained below.

Figure 3.4-1 Risk Assessment Process



(1) **Likelihood of Occurrence:** The likelihood of occurrence is determined for each hazard based on the probability of a major hazard event occurring within Benton County within the next five years. A major hazard event is one with serious potential adverse consequences for some important part of the population, property, infrastructure, or environment. The interval of five years was chosen to fit within the five-year planning cycle of this Plan. Probability of occurrence is categorized as:

- **High:** Great likelihood that a major hazard event will occur within the five year planning cycle.
- **Medium:** Moderate likelihood that a major hazard event will occur within the five year planning cycle.
- **Low:** There is little likelihood that a major hazard event will occur within the five year planning cycle.

Three hazards – floods, wildfires, and windstorms - have been determined to have a high likelihood of occurring within the next five years, and were considered for further risk assessment. These three hazards are relatively frequent occurrences in Benton County, and can result in repetitive and often severe social, economic and physical damage.

Hazards that were determined not to have a high likelihood of occurring within the next five years were not considered further. Additional analyses to further characterize the risks of these other hazards will be conducted in the future based on periodic reviews of this hazard mitigation plan and available resources

(2) **Exposure assessment:** For each hazard, the geographic area directly affected by the hazard is identified based on the available hazard characterization and analyses, past events, or stakeholder input. Everything **inside** the geographic area of the hazard is categorized as exposed to the hazard at a level requiring further assessment. Everything **outside** the area is categorized as exposed at a level that does not warrant further analyses at this stage of the planning process. This approach focuses the initial efforts of this Plan on the direct effects of a hazard occurrence. Broader definitions of exposure may be warranted in the future to encompass the indirect effects of a hazard occurrence as additional resources become available through future cycles of hazard mitigation planning.

(3) **Vulnerability Assessment:** Vulnerability is determined for the population, property, infrastructure, and environment directly exposed to the hazard (e.g., within the geographic area). Vulnerability is categorized as high, medium or low risk depending on the potential for damage, injury, or loss from a major hazard occurrence as follows:

- **High Risk:** There is a strong potential for major to catastrophic damage to the exposed population, property, infrastructure, or environment, and/or major to catastrophic disruption of public services and business within the affected area.
- **Medium Risk:** There is some potential for moderate to major (but not catastrophic) damage to the exposed population, property, infrastructure, or environment, and/or moderate to major disruption of public services and business within the affected area.

- **Low Risk:** There is a potential for low to moderate (but not major) damage to the exposed population, property, infrastructure, or environment, and/or little to moderate disruption of public services and business within the affected area.

The vulnerability ratings are assigned to neighborhoods, communities, geographic areas, and other broad groupings of similar types of land use, infrastructure, or population. Where specific local concerns were identified, specific property or populations of concern may be identified; otherwise, no attempt was made to evaluate vulnerability for individual pieces of property or facilities.

### **3.4.2 Summary of Risk Assessment Results**

The likelihood of occurrence for each hazard based on the probability of a major hazard event occurring within Benton County within the next five years is:

#### **High Likelihood of Occurrence**

- Floods
- Wildfires
- Windstorms

#### **Medium Likelihood of Occurrence**

- Severe Winter Storm
- Drought
- Hazardous Materials & Chemicals
- Transportation
- Urban Fire

#### **Low Likelihood of Occurrence**

- Landslide (e.g., slope stability)
- Earthquake
- Volcanic Eruption (e.g., ashfall)
- Civil Disturbance
- Pipeline
- Radiological
- Terrorism
- Other Local Hazard – Umatilla Chemical Depot
- Other Local Hazard – Hanford Site
- Other Local Hazard – Columbia Generating Station

Accordingly, only floods, wildfires, and windstorms were subject to further risk assessment at this time. Results of the risk assessment for floods, wildfires, and windstorms are presented in Chapter 4, and further described as warranted for each municipality in Sections 2 through 7.

## ***3.5 Mitigation Strategy***

The purpose of the Hazard Mitigation Plan is to protect the health, safety, and economic interests of all County residents by reducing the impacts of natural and technological hazards through hazard mitigation planning, increased public awareness, and implementation of hazard mitigation

measures. Hazard mitigation is any action taken to reduce or eliminate the risk to human life and property from natural and technological hazards.

The Planning Committee has established broad hazard mitigation goals to provide direction for its hazard mitigation planning and the municipalities' implementation of mitigation measures. These goals are supported by one or more objectives, which provide a framework for accomplishing each goal. The objectives provide further direction to the plans, programs, and hazard mitigation measures the municipalities of Benton County will use to implement the Plan. The goals and objectives are focused on areas of hazard mitigation planning that are within the authority and responsibility of the County and its Cities.

The municipalities of Benton County have also identified specific action items to address the plan objectives and implement desired hazard mitigation measures. The identification of specific action items to provide hazard mitigation is limited to those items considered to be practical, cost-effective, and efficient at reducing the risk for those areas with high vulnerability. Where practical, action items are identified that address multiple hazards. In identifying and prioritizing action items, the municipalities have emphasized measures that mitigate the hazard before it occurs. However, for some hazards enhancing response and recovery actions may be the most effective means at the local level to mitigate the hazard. Implementation of some action items will be dependent upon available resources and/or the cooperation of other public and private stakeholders. Multi-jurisdictional action items common to all the municipalities are identified in Section 1, Chapter 7. Specific action items for each municipality are presented in Sections 2 – 7 of the BCHMP.

The goals and objectives for hazard mitigation planning and implementation in Benton County include:

**GOAL No. 1. PROTECTION OF PROPERTY:** Reduce impacts from hazards on individual properties, businesses, and public facilities and infrastructure by encouraging activities that can prevent/reduce damage. The following objectives support successful accomplishment of this goal:

- 1a. Identify voluntary property protection measures available to residents, businesses, industries, and others.
- 1b. Establish public/private partnerships and programs to develop/implement property protection measures aimed at multiple properties and/or areas within the community.
- 1c. Evaluate establishing mandatory property protection measures to address circumstances of high risk and/or protect critical facilities.

**GOAL No. 2. EDUCATION AND OUTREACH:** Enhance public awareness and understanding of hazards and potential risks, including economic vulnerability and mitigation measures. The following objectives will promote effective implementation of this goal:

- 2a. Develop a public education program addressing each of the identified hazards. Target audiences for each hazard outreach program should include school children, individual property owners, the business community, and communities identified as being especially vulnerable for a specific hazard.



- 2b. Develop and disseminate a checklist of personal/family response procedures for hazards describing what to do in the event of a natural hazard emergency.
- 2c. Provide periodic updates to affected communities regarding local efforts in hazard mitigation.
- 2d. Develop and implement outreach programs to gain participation in mitigation programs by business, industry, institutions, community groups, and residents.

**GOAL No. 3. PREVENTIVE PLANNING:** Reduce the risk from hazards to human health and safety and property by developing/enhancing mitigation planning and programming in our communities. The following objectives will facilitate planning efforts:

- 3a. Where existing data is insufficient, obtain data and information necessary for defining hazards, areas at risk, vulnerable populations/property, critical public facilities, and appropriate mitigation measures.
- 3b. Develop the capability to effectively utilize available data and information related to mitigation planning, program development and implementation of the mitigation measures.
- 3c. Measure and document the effectiveness of our mitigation initiatives.
- 3d. Create a program to derive mitigation “lessons learned” from each significant disaster event occurring in or near the County.
- 3e. Maintain up to date technical skills in mitigation planning, programming and implementation in our community.
- 3f. Incorporate information on potential hazards in County and City land use policies, plans, and plan implementation (e.g., zoning/building requirements).
- 3g. Provide incentives to make hazard mitigation a priority for future land development.
- 3h. Incorporate information on hazards mitigation in all capital improvement projects and infrastructure development.
- 3i. Provide incentives to make hazard mitigation a priority for utility system planning, repairs, replacement, and development.

**GOAL No. 4. PARTNERSHIP AND COORDINATION:** Develop partnerships and coordination between all stakeholders in hazard mitigation planning and implementation. The following objectives will promote successful development of partnerships and coordination:

- 4a. Promote hazard mitigation efforts through partnerships between public and private sector organizations.
- 4b. Identify and prioritize mitigation measures that address multiple hazards.

4c. Identify mitigation efforts that involve multiple stakeholders and/or affected areas (i.e. environment, transportation, telecommunications) and involve those stakeholders in development of mitigation alternatives.

4d. Identify advantages and benefits for the private sector that could result from mitigation actions and coordinate public/private sector participation in planning and implementing mitigation projects.

4e. Seek funding and resource partnerships for future mitigation efforts.

**GOAL No. 5. STRUCTURAL MITIGATION MEASURES:** When applicable, utilize structural mitigation measures to reduce risks associated with hazards. The following objectives will support development and implementation of structural alternatives:

5a. Identify simple and effective measures to protect critical facilities.

5b. Identify mitigation alternatives that can be integrated with public infrastructure to lessen the impact of hazards while blending with the existing community features.

5c. Evaluate proposed capital improvements to identify opportunities to implement mitigation alternatives cooperatively with those projects to improve the cost effectiveness of each project.

5d. Prioritize mitigation projects and actively pursue funding for those projects.

**GOAL No. 6. NATURAL RESOURCE PROTECTION:** Preserve and enhance natural systems to serve natural hazard mitigation functions. The following objectives will help to focus efforts on protection of natural resources:

6a. Protect wetlands and floodplains from development that reduces their natural flood hazard mitigation function.

6b. Protect and enhance vegetated buffer areas along rivers, streams, and waterways.

6c. Develop/enhance vegetated and/or irrigated shelterbelts to reduce localized effects of high winds, and/or to provide fire protection.

**GOAL No. 7. EMERGENCY SERVICES:** Enhance life safety protection by promoting, strengthening, and coordinating emergency response planning and response capabilities. The following objectives will improve the effectiveness of existing emergency services in relation to mitigation of hazards:

7a. Ensure all agencies involved in hazard mitigation and planning incorporate information on natural and man-made hazards into their emergency response plans.

7b. Ensure County and City emergency response plans are coordinated with adjacent counties, state, and federal emergency response planning.

7c. Consider emergency response equipment needs and training requirements for emergency response providers as part of hazard mitigation for those hazards where other mitigation measures are not readily available, practical, or effective.

### ***3.6 Mitigation Action Items***

Hazard mitigation is any action taken to permanently eliminate or reduce the long-term risk to human life and property from natural or technological hazards. Hazard mitigation can occur through direct or indirect means. Direct hazard mitigation occurs either through actions taken to reduce the severity, frequency, or extent of the hazard or actions taken to reduce or eliminate exposure (e.g. vulnerability) to the hazard. Indirect hazard mitigation occurs through steps taken to reduce the long-term harmful effects of the hazard, including its aftermath. Hazard mitigation is an essential element of emergency management along with preparedness, response and recovery.

There are few, if any, practical measures available to Benton County to reduce or limit the occurrence of most of the potential natural hazards and many of the technological hazards. Therefore, this Plan has focused its development of mitigation actions on reducing or eliminating the exposure and/or vulnerability of people, property, infrastructure, and the environment to the hazards.

#### **3.6.1 Action Item Identification**

##### **Potential Mitigation Measures**

This Plan has identified potential mitigation measures from various sources that could be used to address the stated hazard mitigation goals and objectives through reducing exposure and/or vulnerability to the hazards. These potential mitigation measures are described in the appropriate hazard chapters (Chapter 4 and 5) within the Plan. These potential mitigation measures are provided as examples of the types of actions that could be used to mitigate specific hazards.

##### **Action Item Identification by the Municipalities**

Action items were identified by each municipality based on staff and stakeholder knowledge of the hazards, past events, hazard characterization information provided within the Plan, and information contained in prior studies and plans. These action items generally fall into the following categories:

###### *Reducing exposure to the hazard:*

- Removing existing development within the area of hazard.
- Restricting future development within the area of hazard.

###### *Reducing vulnerability to the hazard:*

- Providing a structural defense against the impacts of the hazard.
- Providing a nonstructural defense against the impacts of the hazard.
- Providing hazard mitigation education to the affected communities.
- Ensuring that plans, procedures, facilities, equipment, and trained personnel are available to provide for adequate response and recovery.

Action items included within this Plan were also required to meet several additional criteria – each action item or project must:

- a) Substantially reduce the risk of future damage, hardship, loss, or suffering from a hazard;
- b) Address a problem that is repetitive or that poses a significant risk if left unsolved;
- c) Contribute substantially to a long-term solution;
- d) Provide cost-effective protection of the projected life of the action item;
- e) Conform to federal and state environmental regulations, as well as other local plans, policies, and regulations;
- f) Have manageable long-term operations and maintenance requirements; and.
- g) Reflect the most practical, effective and environmentally sound solution from among all alternatives considered.

Multi-jurisdictional action items common to all of the municipalities are contained in Section 1, Chapter 7. These multi-jurisdictional action items will be jointly implemented by all of the municipalities. Action items that have been adopted by specific municipalities and are therefore subject to implementation by that municipality are described in each municipality's action plan (Sections 2 – 7).

### 3.6.2 Prioritizing Action Items

Each mitigation action item is assigned a *high, medium, or low* priority for implementation. The municipalities will focus their efforts on implementing the action items according to their assigned priority, with high priority items receiving the primary focus, medium priority items receiving a moderate focus, and low priority items receiving a lesser focus. Each municipality established priorities for their mitigation action items as follows:

**Multi-jurisdictional Action Items** – Action items that are common to one or more jurisdictions are assigned a higher priority.

**Multi-hazard Action Items** – Within each municipality, action items that address multiple hazards are assigned a higher priority.

**Individual Action Items** - Priority for individual action items addressing a single hazard and applicable to a single municipality is established by staff and stakeholders within the respective municipality based upon factors relevant to the municipality, the hazard, and the action item. The following factors were considered in assigning priorities to the individual action items:

- Importance to municipality
- Effectiveness at reducing risk
- Ease of administration
- Necessary step prior to another action item
- Project cost
- Potential availability of resources
- Benefit/cost comparison
- Priorities already established in capital facilities and/or comprehensive plans.

### 3.6.3 Implementation of Mitigation Action Items

Staff from each of the municipalities has developed an initial approach to implementing the action items, including identifying the lead agency, resources, and timeline as follows:

**Lead Agency:** The Lead Agency is the municipal agency or department that is responsible for implementing the action item. The Lead Agency may do the actual implementation, or serve as the team manager/coordinator where implementation requires resources from multiple agencies within or outside the municipality.

**Resources:** Resources define how the municipality expects to pay for the mitigation action. Resources are categorized as:

- **Internal Resources** – Internal resources are developed through the normal municipal budget process, either through the lead agency's operating budget, capital facilities budget, lump sum appropriation, bond issue, or whatever mechanism best suits the needs of the municipality.
- **External Resources** – External resources are basically federal, state, or private grant monies or funding sources. Such external resources include FEMA grants (Hazard Mitigation Grants Program, Flood Mitigation Assistance Program, Assistance to Firefighters Grants Program, Fire Prevention and Safety Grants, Equipment Acquisition Grants, etc.), Department of Homeland Security grants through the Office of Domestic Preparedness or Emergency Preparedness and Response, state grants, and other sources.
- **Combined Resources** – Combined resources include come combination of project funding from both internal and external sources. Combined resources include resources from multiple municipalities or agencies used for multi-jurisdictional action items.

**Timeline:** The mitigation action item timeline defines the period in which the municipality expects to implement the action item. Implementation of all mitigation action items begins with approval of the Plan by the municipalities and by EMD and FEMA. The timeline is:

- **Short-term:** The action item is to be implemented within 0 to 2 years of plan approval.
- **Mid-term:** The action item is to be implemented within 3 to 5 years of plan approval.
- **Long-term:** Implementation of the action item is expected to exceed the five-year planning cycle.

The initial determinations of resources and timeline will be refined as necessary as each mitigation action item moves through its planning, design, and implementation stages.

### ***3.7 Plan Adoption***

The BCHMP is officially adopted by the Benton County Commissioners, and by the City Councils of Benton City, Kennewick, Prosser, Richland<sup>1</sup>, and West Richland. Specifically, each municipality adopts Section 1 of the BCHMP and adopts that Section setting forth their specific Hazard Mitigation Action Plan, as shown in Table 1-1. These governing bodies have the authority to promote sound public policy regarding natural and technological hazards. Once the BCHMP has been adopted, the Steering Committee will be responsible for submitting it to the State Hazard Mitigation Officer at the Washington Division of Emergency Management (WDEM). WDEM will then submit the plan to the Federal Emergency Management Agency (FEMA) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, Benton County will gain eligibility for Hazard Mitigation Grant Program funds.

### ***3.8 Plan Implementation***

Future activities required to ensure plan implementation and maintenance are discussed in Chapter 6.

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<sup>1</sup>The City of Richland has developed and adopted its own Natural Hazard Mitigation Plan, providing direction for mitigation of natural hazards within the City's boundaries. Richland's Natural Hazard Mitigation Plan is incorporated herein by reference as Section 5 of the BCHMP.